REMARKS

This Amendment is submitted in response to the Office Action dated February 1, 2011, having a shortened statutory period set to expire May 1, 2011.

I. Claim objections

In paragraph 3 of the present Office Action, the Examiner objects to the claims as misnumbered. In response, Applicant has corrected the numbering of Claims 31 and 32 herein.

II. Rejection under 35 U.S.C. § 101

In paragraphs 5-6 of the present Office Action, Claims 21-23 are rejected under 35 U.S.C. § 101 as directed to nonstatutory subject matter. In the rejection the Examiner argues in substance that "a 'computer-readable storage medium," typically covers forms of non-transitory tangible media and transitory propagating signals per se in view of the ordinary and customary meaning of **computer readable media**" (emphasis supplied).

Applicant respectfully traverses the rejection under 35 U.S.C. § 101 because the Examiner's reasoning ignores the explicit recitation in Claim 21 of a "computer-readable storage medium" rather than merely a computer-readable medium. Applicant respectfully submits that the broadest reasonable interpretation of a "computer-readable storage medium" does not include non-tangible transitory signals and that it is not possible to adduce any example of a computer-readable storage medium that is a non-tangible transitory signal. Nevertheless, in order to advance prosecution, Applicant has amended Claim 21 herein to recite a "tangible computer-readable storage medium" to allay the Examiner's concern that Claims 21-23 encompass non-tangible transitory signals *per se*.

In view of the foregoing remarks and the amendment to Claim 21, Applicant respectfully submits that the rejection of Claims 21-23 under 35 U.S.C. § 101 is overcome.

III. Rejections under 35 U.S.C. § 103

A. Rejection of Claims 1 and 4-6 in view of *Chawla* and *Fedyk*

In paragraphs 16-21 of the present Office Action, Claims 1 and 4-6 are rejected under 35 U.S.C. § 103 as unpatentable over U.S. Patent No. 6,876,668 to *Chawla et al.* (*Chawla*) in view of U.S. Patent No. 7,154,851 to *Fedyk et al.* (*Fedyk*). That rejection is respectfully traversed as it might be applied to the claims as amended herein.

1. Combination of *Chawla* and *Fedyk* does not disclose "performing an initial link layer operating frequency negotiation" as recited in exemplary Claim 1

Applicant respectfully submits that the combination of *Chawla* and *Fedyk* does not render exemplary Claim 1 unpatentable under 35 U.S.C. § 103 because that combination of references does not disclose or render obvious performing an initial link layer operating frequency negotiation as recited in exemplary Claim 1 as follows:

> performing an initial link layer operating frequency negotiation between a server and a switch to which the server is connected, wherein the initial link layer operating frequency negotiation establishes an initial total bandwidth capacity of a network link between the server and the switch at an initial operating frequency of the network link;

With reference to the foregoing step of exemplary Claim 1, page 6 of the present Office Action cites col. 5, lines 20-25 and col. 12, line 61 through col. 13, line 4 of *Chawla*. The first of these passages discloses:

> Also included is a bandwidth reservation processor coupled to the input port which accepts a first bandwidth reservation request indicating a first amount of bandwidth to reserve for the session of data communication in the data communications device.

The second cited passage of *Chawla* elaborates on this reservation process as follows:

> Continuing with the example, the bandwidth reservation processor 500 in each device 201-B through 201-E receives the RSVP path and bandwidth reservation request messages. If the bandwidth reservation processor 500 determines that a requesting application or host (e.g., receiving hosts 210-A2 or

> 210-A3) has permission or privileges to reserve the requested bandwidth (*e.g.*, RSVP policy control) and also determines that the requested resource (*e.g.*, the 100 Kbps bandwidth) is available in the device 201, the bandwidth reservation processor 500 in each data communications device 201-B through 201-E grants the request and establishes the 100 Kbps bandwidth reservation for the "A" data stream 203 along the path from sending host 210-A1 to receiving hosts 210-A2 and 210-A3.

The combination of *Chawla* and *Fedyk* does not render exemplary Claim 1 unpatentable under 35 U.S.C. § 103 because that combination does not disclose or render obvious "an initial link layer operating frequency negotiation … [that] establishes an initial total bandwidth capacity of a network link between the server and the switch at an initial operating frequency of the link," as claimed. Instead, the cited teaching of *Chawla* as combined with *Fedyk* discloses use of reservation requests to reserve, for a particular data stream, a portion of the total available bandwidth on a network link. Because the combination of *Chawla* and *Fedyk* does not disclose or render obvious each feature of exemplary Claim 1 as amended, Applicant respectfully submits that the rejection of exemplary Claim 1, similar Claims 7 and 21, and their respective dependent claims under 35 U.S.C. § 103 is overcome.

2. Combination of *Chawla* and *Fedyk* does not disclose "measuring an effective data rate" as recited in exemplary Claim 1

Applicant respectfully submits that the combination of *Chawla* and *Fedyk* also does not render exemplary Claim 1 unpatentable under 35 U.S.C. § 103 because that combination of references does not disclose or render obvious the measurement of an effective data rate as recited in exemplary Claim 1 as follows:

> following the initial link layer operating frequency negotiation, the server communicating network traffic with the switch over the network link and measuring an effective data rate of the network traffic communicated between the server and the switch over the network link.

With reference to the foregoing step of exemplary Claim 1, page 6 of the present Office Action cites col. 12, line 61 through col. 13, line 4 of *Chawla*, reproduced *supra*. As noted above, the cited passage of *Chawla* as combined with *Fedyk* discloses use of reservation requests to reserve, for a particular data stream, a portion of the total available bandwidth on a network

link in advance of use of the bandwidth. The present Office Action additionally cites col. 13, lines 20-24 of *Chawla*, which in its larger context disclose:

> Extending the example, assume that each recipient host 210-A2 and 210-A3 receives the "A" data stream 203 at the reserved rate of 100 Kbps. That is, the bandwidth reservation processor 500 configures each data communications device 201-B through 201-E with a bandwidth reservation of 100 Kbps of its total bandwidth (i.e., its total data transfer capacity or throughput for the path specified for, or required by, the data stream) for the "A" video stream packets 203 which are continuously delivered to the recipient hosts 210-A2 and 210-A3 in real-time across network 200. If a video client application (not shown) executing on recipient host 210-A3 senses that more network bandwidth is required (such as 120 Kbps) to effectively receive the "A" video data stream 203, the host 210-A3 can use RSVP to make a bandwidth reservation request (not shown) containing bandwidth allocation adjustment information to each network device 201-E, 201-D, 201C and 201-B. The bandwidth allocation adjustment information in the bandwidth reservation request specifies a request for 120 Kbps of bandwidth to be reserved for the "A" video data stream 203.

This second passage of *Chawla* thus discloses that a video client application can sense the requirement for additional network bandwidth for a data stream and make a reservation request for additional reserved bandwidth. Finally, Fig. 2 and col. 3, line 61 through col. 4, line 3 of *Fedyk* is additionally cited as disclosing the assignment of bandwidth to a connection based on available bandwidth and traffic engineering.

Even assuming *arguendo* the Examiner's position that the combination of *Chawla* and *Fedyk* yields a system that permits bandwidth reservation at the link layer (rather than at a higher layer as taught by *Chawla*), the cited teaching of *Chawla* and *Fedyk* does not disclose or render obvious "measuring an effective data rate of the network traffic communicated between the server and the switch over the network link," as claimed. Specifically, the citation combination of *Chawla/Fedyk* discloses two different scenarios: (1) reservation of portion of the total available bandwidth for a connection/data stream prior to data transmission under the reservation, and (2) a client application sensing that bandwidth of an existing reservation for a connection/data stream is inadequate for the connection/data stream and consequently requesting reservation of larger portion of the total available bandwidth.

The first of these two scenarios does not disclose the claimed step of "measuring an effective data rate of the network traffic communicated between the server and the switch" because the reservation is made prior to any data communication under the reservation and thus does not measure the effective data rate of the data communication. The combination of references further fails to disclose "the communication link is tested to adequately determine whether an effective data rate … is actually available" as asserted by the Examiner in paragraph 34 of the present Office Action. There is simply no objective support for this asserted testing of the communication link in the references of record.

The second of these two scenarios similarly does not disclose or render obvious the claimed "measuring" step because sensing the inadequacy of an existing reserved bandwidth for a connection/data stream does not necessitate or suggest measurement of the effective data rate of the connection/data stream. For example, streaming applications commonly use an error rate (rather than the effective data rate) to detect that more bandwidth is required for a data stream.

Because neither of the scenarios disclosed by *Chawla/Fedyk* discloses or renders obvious "measuring an effective data rate of the network traffic communicated between the server and the switch over the network link," as claimed, Applicant respectfully submits that the rejection of exemplary Claim 1, similar Claims 7 and 21, and their respective dependent claims under 35 U.S.C. § 103 is overcome.

3. Combination of *Chawla* and *Fedyk* does not disclose "performing a subsequent link layer operating frequency negotiation" as recited in Claim 1

Applicant respectfully submits that the combination of *Chawla* and *Fedyk* also does not render exemplary Claim 1 unpatentable under 35 U.S.C. § 103 because that combination of references does not disclose or render obvious performing a subsequent link layer operating frequency negotiation as recited in exemplary Claim 1 as follows:

> responsive to determining by the measuring that the effective data rate is materially less than the initial total bandwidth capacity of the network link operating at the initial operating frequency, performing a subsequent link layer operating frequency negotiation to establish a decreased total bandwidth capacity of the network link at a decreased operating frequency of the network link,

wherein the decreased operating frequency is closer to the measured effective data rate than the initial operating frequency.

With reference to the foregoing step of exemplary Claim 1, the present Office Action again cites col. 13, lines 20–24 of *Chawla* (reproduced *supra*) as disclosing performing a subsequent bandwidth reservation negotiation to obtain increased bandwidth for a data stream. Again assuming the Examiner's position *arguendo*, the cited passage of *Chawla* in combination with *Fedyk* discloses reserving an increased bandwidth for a data stream/connection at the link layer.

Because the combination of *Chawla/Fedyk* discloses only the reservation of an increased bandwidth in a subsequent reservation negotiation, that combination of references does not disclose or render obvious a "decreased operating frequency [that] is closer to the measured effective data rate than the initial operating frequency," as now recited in Claim 1. Further, the combination of *Chawla/Fedyk* does not disclose or render obvious "performing a subsequent link layer operating frequency negotiation to establish a decreased total bandwidth capacity of the network link," as now recited in Claim 1. Because the combination of *Chawla* and *Fedyk* does not disclose or render obvious each feature of exemplary Claim 1 as amended, Applicant respectfully submits that the rejection of exemplary Claim 1, similar Claims 7 and 21, and their respective dependent claims under 35 U.S.C. § 103 is overcome.

4. Exemplary Claim 4

The rejection of Claim 4 under 35 U.S.C. § 103 in view of the combination of *Chawla/Fedyk* is not well founded and should be withdrawn. In paragraph 19 of the present Office Action, col. 11, lines 25-36 of *Chawla* is cited as teaching wireless networks. The Examiner asserts that the features of Claim 4 are met because "IEEE 802.3 is considered just an example of a wireless network."

That rejection is not well founded and should be withdrawn because the cited teaching of *Chawla* is inapposite to the features of Claim 4, which recites "the initial and subsequent link layer operating frequency negotiations are compliant with the IEEE 802.3 standard." The mere disclosure of wireless networks does not disclose use of the IEEE 802.3 standard, which is

directed to link layer negotiation in a wired network. In view of the foregoing remarks, Applicant therefore respectfully submits that the rejection of exemplary Claim 4 under 35 U.S.C. § 103 is overcome.

5. Exemplary Claim 5

The rejection of Claim 5 under 35 U.S.C. § 103 in view of the combination of *Chawla/Fedyk* is similarly not well founded and should be withdrawn. In paragraph 20 of the present Office Action, the Examiner again cites col. 13, lines 20-27 of *Chawla*, reproduced *supra*. As noted above, a video application sensing the inadequacy of an existing reservation for a data stream as taught by *Chawla* does not disclose or render obvious the features of the claimed "measuring" step recited in Claim 5 because sensing the inadequacy of an existing reserved bandwidth for a connection/data stream does not necessitate or suggest measurement of the effective data rate of the connection/data stream. For example, streaming applications commonly use an error rate (rather than the effective data rate) to detect that more bandwidth is required for a data stream. Consequently, the rejection of exemplary Claim 5 under 35 U.S.C. § 103 in view of the combination of *Chawla/Fedyk* is not well founded and should be withdrawn.

6. Exemplary Claim 6

The rejection of Claim 6 under 35 U.S.C. § 103 in view of the combination of *Chawla/Fedyk* is also overcome because the cited combination of references does not disclose or render obvious the following features of Claim 6:

> responsive to determining that the effective data rate is greater than a specified percentage of the initial total bandwidth capacity of the link, performing a subsequent link layer operating frequency negotiation to establish an increased total bandwidth capacity of the network link at an increased operating frequency of the link, wherein the increased operating frequency is higher than the initial operating frequency.

With reference to the foregoing features of Claim 6, paragraph 21 of the present Office Action again cites col. 13 of *Chawla*, reproduced and analyzed *supra*. While the combination of *Chawla/Fedyk* is cited as disclosing requesting a reservation for an increased portion of the bandwidth of a data link, the cited combination of *Chawla/Fedyk* does not disclose or render

obvious "performing a subsequent link layer operating frequency negotiation to establish an increased total bandwidth capacity of the network link" as now recited in Claim 6. Consequently, Applicant respectfully submits that the rejection of exemplary Claim 6 under 35 U.S.C. § 103 in view of *Chawla/Fedyk* is overcome.

B. Rejection of Claims 24-26 in view of *Chawla, Fedyk* and *Ravi*

In paragraphs 29-32 of the present Office Action, Claims 24-26 are rejected under 35 U.S.C. § 103 as unpatentable over the combination of *Chawla/Fedyk* and U.S. Patent No. 6,292,834 to *Ravi et al.* (*Ravi*). That rejection is also respectfully traversed.

1. Exemplary Claim 24

Applicant respectfully submits that the rejection of Claim 24 is overcome because the combination of cited references does not disclose "the decreased operating frequency is a lowest operating frequency of the network link accommodated by the server and switch that is sufficient to handle the effective data rate," as recited in Claim 24. As noted by the Examiner, *Ravi* discloses at col. 7, lines 16-25 that an application can request that the reservation for a data stream be decreased. However, because the combination of *Chawla/Fedyk* and *Ravi* does not disclose the measurement of an effective data rate (as discussed *supra*), the combination of *Chawla/Fedyk* and *Ravi* does not disclose or render obvious the claimed relationship between the "decreased operating frequency" and the "effective data rate." Consequently, the rejection of exemplary Claim 24 under 35 U.S.C. § 103 in view of combination of *Chawla/Fedyk* and *Ravi* is overcome.

2. Exemplary Claim 25

Applicant respectfully submits that the rejection of Claim 25 is overcome because the combination of cited references does not disclose the following features of Claim 25:

> automatically repeating, at specified intervals during the operation of the data processing network, the measuring of the effective data rate and contingent initiation of a subsequent link layer operating frequency negotiation to automatically and periodically modify the operating frequency of the network link to a lowest operating frequency compatible with the effective data rate.

With reference to the foregoing features, paragraph 31 of the present Office Action again cites col. 13, lines 20-27 of *Chawla*, discussed *supra*. In addition to failing to disclose the claimed link layer operating frequency negotiation (as discussed in detail *supra*), the cited passage does not disclose the "specified intervals" or periodic modification of operating frequency recited in Claim 25. Consequently, the rejection of exemplary Claim 25 under 35 U.S.C. § 103 in view of combination of *Chawla/Fedyk* and *Ravi* is overcome.

3. Exemplary Claim 26

Applicant respectfully submits that the rejection of Claim 26 under 35 U.S.C. § 103 is overcome because the combination of cited references does not disclose the following features of Claim 26:

> in response to performing the subsequent link layer operating frequency negotiation, decreasing an operating frequency and power consumption of a network interface of the server.

With reference to the foregoing features, paragraph 32 of the present Office Action again cites col. 7, lines 16-25 of *Chawla*, which disclose the establishment of a bandwidth reservation. The Examiner additionally asserts, without any objective foundation in the references or otherwise, that "a lower power consumption is deemed a by-product of decreased bandwidth usage." Applicant respectfully traverses the Examiner's unsupported assertion and requests that the Examiner furnish a reference supporting the assertion. Applicant further respectfully points out that the Examiner has not made a *prima facie* case of obviousness with reference to Claim 26 because the Examiner has not alleged that the combination of cited references discloses "decreasing an operating frequency ... of a network interface of the server." Consequently, the rejection of exemplary Claim 26 under 35 U.S.C. § 103 in view of combination of *Chawla/Fedyk* and *Ravi* is not well founded and should be withdrawn.

C. Rejection of Claims 21-23 in view of *Chawla* and *Ravi*

In paragraphs 22-28 of the present Office Action, Claims 21-23 and 27-32 are rejected under 35 U.S.C. § 103 as unpatentable over the combination of *Chawla* in view of *Ravi*. That rejection is also respectfully traversed. In the present Amendment, Applicant has amended Claim 21 to substantially recite the features of exemplary Claim 1, which as noted above is patentable over the combination of *Chawla* and *Fedyk*. The additional citation of *Ravi* as teaching "dynamically adjusting bandwidth rates" does not address any of the noted deficiencies in the combination of *Chawla* and *Fedyk* discussed *supra* in paragraphs III(A)(1)-III(A)(3) and III(B)(1)-III(B)(3). Consequently, Applicant respectfully submits that the rejections of Claims 21-23 and 27-32 under 35 U.S.C. § 103 as unpatentable over the combination of *Chawla* in view of *Ravi* is also overcome.

IV. Rejection under 35 U.S.C. § 102

In paragraphs 7-15 of the present Office Action, Claims 7 and 10-15 are rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,876,668 to *Chawla et al.* (*Chawla*). That rejection is also respectfully traversed. In the present Amendment, Applicant has amended Claim 7 to substantially recite the features of exemplary Claim 1, which as noted above is patentable over the combination of *Chawla* and *Fedyk*. The citation of *Chawla* alone does not address any of the noted deficiencies in the combination of *Chawla* and *Fedyk* discussed *supra* in paragraphs III(A)(1)-III(A)(3) and III(B)(1)-III(B)(3). Consequently, Applicant respectfully submits that the rejections of Claims 7 and 10-15 under 35 U.S.C. § 102 as unpatentable over *Chawla* in view of *Ravi* is also overcome.

V. Conclusion

The foregoing remarks demonstrate that the presently pending claims are not rendered unpatentable by the combination of *Chawla*, whether considered alone or in combination with *Fedyk* and/or *Ravi*. Applicant accordingly respectfully submits that all claims now pending are in condition for allowance and respectfully requests such allowance.

No additional fee is believed to be required. However, should any fees be required, please charge such fees to **IBM Deposit Account No. 09-0447.**

Respectfully submitted,

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